Leptons

ST 403
ST 406

USER'S MANUAL

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Leptons

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1. GENERAL INFORMATION

This "**USER MANUAL"** contains all the information and precaution which have to be taken for the safe and long-term operation of the **ST 403** and/or **ST 406** printer(s).

Maintenance must be carried out at regular intervals and any repairs, if required, must be done at our **Head Office** or by **Authorized Dealers**, which have the equipment and qualified, trained personnel to operate according to instructions given by factory technicians.

DATAPROCESS INDUSTRIA S.p.A. shall not be held liable in any way for incorrect maintenance operations carried out by unauthorized technicians nor shall it be liable for any damages arising from the use of uncertified spare parts.

DATAPROCESS INDUSTRIA S.p.A. does not accept any liability for damages which may be sustained directly or indirectly by persons or things, arising from installation or use of the **ST 403 / ST 406** printer which differs from that stated in this manual.

The ST 403 and/or ST 406 printer(s) must be installed according to the safety precautions and installation instructions given in this "USER MANUAL".

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DATAPROCESS INDUSTRIA S.p.A. is not liable for damages arising from incorrect installation or maintenance, nor for loss of income arising from any failures; moreover it does not accept any liability for improper use of the printer.

2. DESCRIPTION OF THE PRINTER

The ST 403 and/or ST 406 printers are part of a range of overprinters for paper tags and self-adhesive labels, which operate by both a direct thermal technique and a thermal transfer one.

The printers have been designed as an industrial-type unit so they can be used in all company environments requiring a product which is able to sustain heavy work loads whilst performing to high standards.

Particular knowledge and/or equipment are not required for installation; for safety purposes the instructions given in this manual under paragraph 6 must be strictly followed.

The machine is extremely simple to use and does not require preliminary operations, apart from insertion of the label rolls and ribbon cartridges, as described in the relevant paragraphs.

3. TECHNICAL CHARACTERISTICS

The following data refers to the ST 406 model, apart for figureHs in brackets which refer to the ST 403 model.

- **PRINTING METHOD:** ribbon transfer printing and direct thermal printing on thermal paper

  PRINTHEAD RESOLUTION:
  HORIZONTAL: 8 dots/mm

- **PRINTING SPEED:** from 50 to 200 mm/sec.

- **PAPER FEED SPEED:** from 50 to 250 mm/sec.

- **PRINTING AREA:**
  WIDTH: from 160 mm (80 mm), equivalent to 1280 dots (640 dots).
  HEIGHT: up to 1250 mm, equivalent to 9999 dots, depending on memory configuration and memory expansion installed.

- **MAXIMUM LABEL LENGTH:** up to 1250 mm

- **SIZE OF LABEL ROLL:**
  WIDTH: from 60 to 180 mm (from 30 to 90 mm)
  EXTERNAL DIAMETER: maximum 300 mm
  INTERNAL DIAMETER: from 40 - 45 mm - optional 3" -76 mm.

- **SIZE OF RIBBON CARTRIDGE:**
  WIDTH: from 60 to 165 mm (from 30 to 85 mm)
  EXTERNAL DIAMETER: maximum 70 mm
  INTERNAL DIAMETER: 25 mm.

- **LABEL SUBSTANCE:** from 60 to 200 µm, from 50 to 180 g/m^2.

- **LABEL SENSORS:**
  TRANSPARENCY SENSOR: 5 and 40 mm from the label edge
  REFLECTION SENSOR: 5 mm from the label edge

- **FONTS:** Twenty different proportionally spaced fonts, three fixed space fonts, five fonts which can be pre-set by the user, two graphic fonts for logos and symbols, five proportionally spaced fonts, set of international characters.

- **BAR CODES:** Code 39, Code 93, 2/5 INTERLEAVED, CODABAR, EAN 8, EAN 13, EAN 128, UPC-A, UPC-E, Code 128, ADD-ON, ITF 14, ITF 16.

- **STANDARD INTERFACE:** Asynchronous serial RS232 C - full duplex-
  BAUD RATE: from 300 to 38400 bits/sec
  PROTOCOL: RTS/CTS , XON/XOFF with a 64Kb reception buffer

- **POWER SUPPLY:** 220 V +10%/-15 %, 50/60 Hz.
  ABSORPTION: 200 VA max (200 VA max)

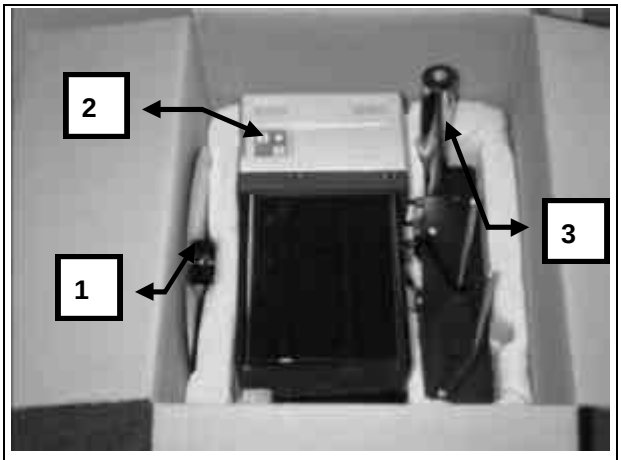
- **SIZE:**
  - **WIDTH:** 385 mm (310 mm)
  - **DEPTH:** 320 mm - 465 mm with unwinder/rewinder unit
  - **HEIGHT:** 245 mm - 454 mm with unwinder/rewinder unit

- **WEIGHT:**
  - **BASE UNIT:** 14.350 Kg. (12.100 Kg.)
  - **WITH UNWINDER/REWINDER UNIT:** 18.750 Kg. (16.500 Kg.)

- **ROOM CONDITIONS:**
  - **TEMPERATURE:** from 5° to 40° C
  - **HUMIDITY:** from 20 a 85 % without condensation.

4. UNPACKING AND INSPECTION

Open the packaging and check that the following components are included:



KEY:
1. **PLEXIGLASS DISK AND USER MANUAL**
1. **PRINTER MECHANISM**
1. **UNWINDER UNIT**

LIST OF COMPONENTS:

- **User Manual**
- **Printer mechanism ST 403/ST 406.**
- **Power cord.**
- **Dust cover.**
- **Unwinder unit equipped with plexiglass disk and spacers.**
- **Flange unit for blocking the labels roll**

LIST OF COMPONENTS INSIDE THE PRINTER:

- **Replaceable thermal transfer ribbon cartridge.**
- **Thermal transfer ribbon rewinder fork.**
- **Thermal transfer ribbon cartridge blocking fork.**

WARNING: Check that the USER'S GUIDE for the printer is contained inside the packaging, as it is an integral item for machine safety.

Keep the boxes and all packing material, as these may be useful for transporting the machine on company premises.
Inspect the machine for any damage which may have arisen during transport and in particular:

1. **Check the entire outer part of the machine.**
1. **Remove the plexiglass protective cover to check for any damage inside the machine.**

In the event of visible damage:

1. **Immediately notify the transport company of the damage sustained by the equipment.**
1. **Keep all packing material available for inspection by the transport company.**
1. **Make out a detailed report, including the extent of the damage and transport company used and inform DATAPROCESS INDUSTRIA S.p.A. and/or your Local Dealer.**

WARNING: DATAPROCESS INDUSTRIA S.p.A. is not in any way liable for damage sustained during transport of the equipment and will not repair this equipment under WARRANTY.

5. STORAGE AND TRANSPORT

If the ST 403/ ST 406 label printer is not used straightaway, store it in its original packing in the following conditions:

- **Room temperature: from 5° C to 40° C**
- **Relative humidity: from 20% to 85% without condensation**

5.1. TRANSPORT

To ensure safe transport of the printer, it is advisable to carefully follow the instructions below.

5.1.1. TRANSPORT ON COMPANY PREMISES

1. Disconnect the printer from the mains, following the procedures described in paragraph 6.
1. Remove the data cable from the printer's serial socket, following the procedures described in paragraph 6.1.
1. Check that the plexiglass cover is correctly fitted in its base.

Once the machine has been disconnected from the mains and from its data source, place it on a trolley for safe transport.

WARNING: The printer must never be lifted by the rubber coated printer roller support. It is advisable to lift it holding the tripod with one hand and left side of the machine body with the other.

5.1.2. TRANSPORT OUTSIDE COMPANY PREMISES

Disconnect the printer from the mains and data source as described in point **"5.1.1"**, disassemble the unwinder/rewinder unit, according to the procedures described in paragraph 7, pack the printer and unwinder/rewinder unit in their original packaging.

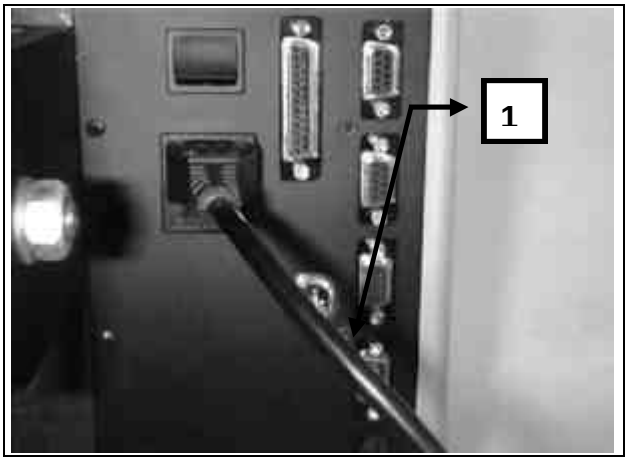
5.2. WORK PLACE

The ST 403/ST 406 printer can be installed on any flat surface, provided that it is sturdy and stable enough to support the printer's weight and that it is big enough for the printer and its accessories.

- **Place the unit in an adequately ventilated area in order to prevent the unit from overheating.**

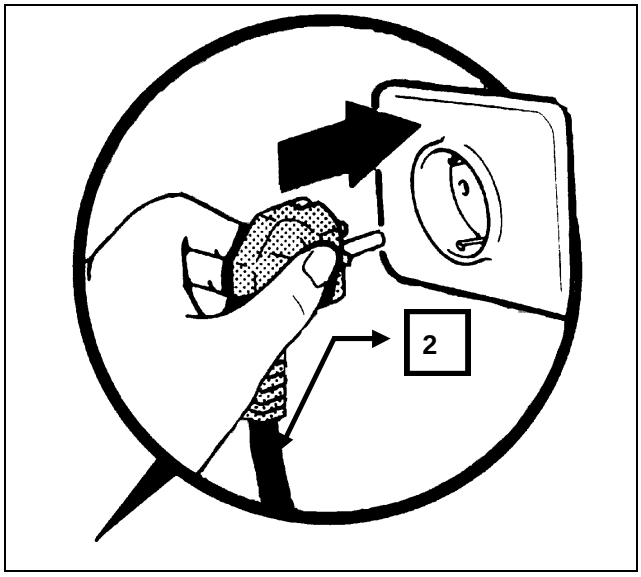
6. ELECTRICAL CONNECTIONS

WARNING: The printer must be connected to the mains using the cable supplied.



To ensure a proper and safe connection to the mains, follow the steps described on this page, shown in the diagrams:

1. Plug in the female connector of the power cable to the appropriate socket, located on the printer's rear panel.



1. Connect the **"SCHUKO"** plug of the power cable to a compatible socket which has an electrical output of:

220VAC +10%/-15% - 50/60 Hz.

WARNING: Make sure the power cable is connected to mains which are earthed. The mains should conform to EEC or EU regulations in force.

6.1. NOTICE FOR CUSTOMERS IN THE UNITED KINGDOM

WARNING: If the supplied plug is not suitable for the socket outlets in your factory, remove it and fit an appropriate plug according to the following instructions:

IMPORTANT: The wires in these mains lead are coloured according to the following code:

GREEN and YELLOW	**:**	**EARTH**
BLUE	**:**	**NEUTRAL**
BROWN	**:**	**LIVE**

As the colours of the wires in the main lead of this equipment may not correspond with the coloured marking identifying the terminals in your plug, proceed as follows:

- **The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter "E" or by the earth symbol,**

or coloured green and yellows.

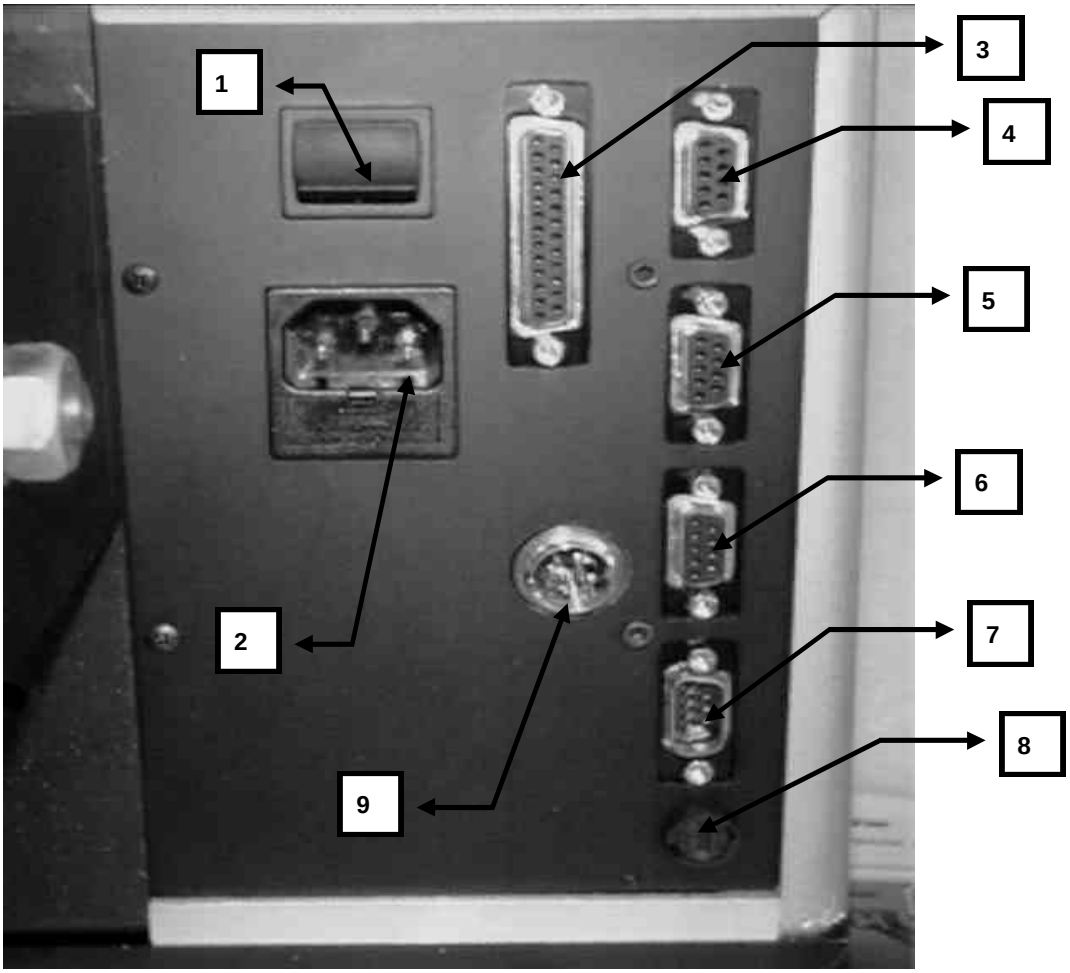
- **The wire that is coloured blue must be connected to the terminal that is marked with the letter "N" or coloured black.**

- **The wire that is coloured brown must be connected to the terminal that is marked with the letter "L" or coloured red.**

6.2. REAR PANEL, CONNECTIONS

The printer's rear panel is equipped with several connectors so the printer can be connected to both the data source and to a series of specially designed peripheral equipment.

The figure in the next page depicts the rear panel, specifying all the components and their function.



KEY:

1. **POWER SWITCH**
1. **SOCKET WITH 5 X 20 mm FUSE - with 1.6 A fuse**
1. **25 PIN FEMALE CONNECTOR FOR PARALLEL INTERFACE**
1. **9 PIN FEMALE CONNECTOR FOR SERIAL INTERFACE**
1. **9 PIN FEMALE CONNECTOR FOR PNEUMATIC APPLICATION GROUP**
1. **9 PIN FEMALE CONNECTOR FOR PRODUCT DETECTION PHOTOELECTRIC CELL**
1. **9 PIN MALE CONNECTOR FOR RELAY CONNECTION**
1. **5 X 20 mm FUSE BOX - with 10 A fuse**
1. **4 POLE MALE NANO CONNECTOR FOR REWINDER/CUTTER INTERFACE**

Appendix A fully describes the signals on the various interfaces.

Connect the printer to the mains with the supplied power cable, following the instructions given in paragraph 6.

Use a serial cable connected to a RS 232 connector (type D 9 poles) to interface the printer to an external control device (PC, Video Monitor, etc). The serial cable pin design is listed in appendix A.

Before turning on the printer's power switch (when this is off, a red coloured **"0"** is displayed), check that the connector is correctly plugged in as described in paragraph 6.

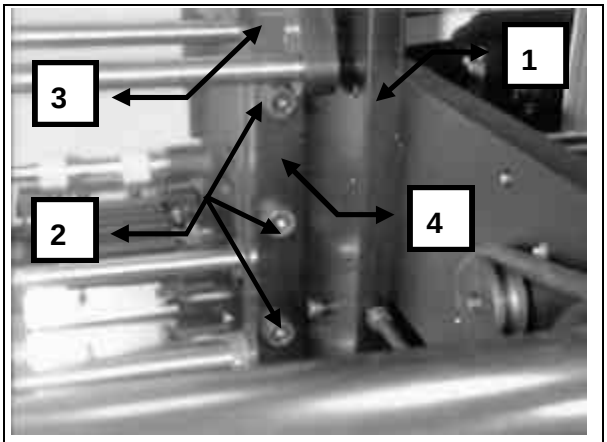
7. FITTING THE UNWINDER

The printers are equipped with an unwinder for unwinding label rolls with a maximum external diameter of 300 mm.

Carefully follow the instructions below to fit the unwinder:

Remove the unwinder from its packing and place it on the rear side of the machine, so that the label roller shaft faces the plexiglass cover, insert the three M8 socket head screws (supplied with the printer) in the holes on the printer support and tighten them, as shown in the figure on the left.

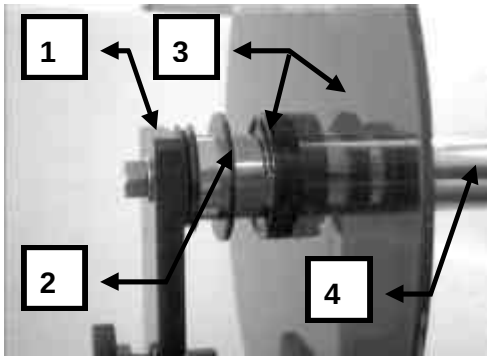
Make sure the unit is perpendicular to the machine base and parallel to the printer's support, tighten the screws thoroughly to prevent the unit from moving under the weight of the label spools. At this stage, fit the plexiglass disk according to the following instructions:



KEY:
1. **UNWINDER UNIT**
2. **SECURING SCREWS**
3. **SUPPORT**
4. **UNWINDER UNIT SUPPORT**

7.1. FITTING THE PLEXIGLASS DISK TO THE ROLL HOLDER

Remove the 3 mm thick spacer from its packing and the large plexiglass disk.



KEY:

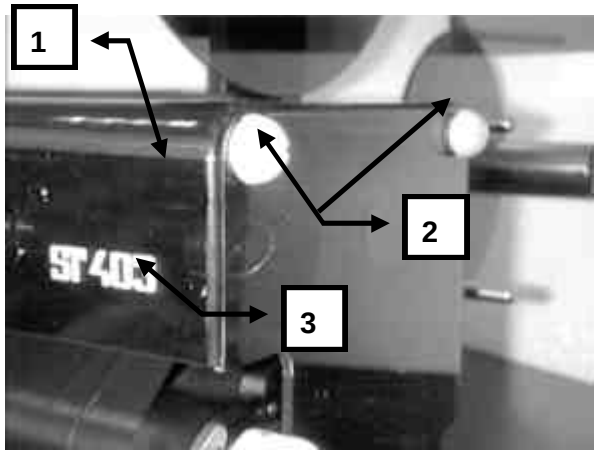
1. **UNWINDER SHAFT SUPPORT**
2. **3 mm SPACER**
3. **PLEXIGLASS DISK WITH BASEBOARD**
4. **UNWINDER SHAFT**

Fit the spacer and then the plexiglass disk to the label roller shaft, ensuring that the flange faces the aluminium support base.

Push the components towards the support and tighten the screw fitted on the flange as shown in the figure on the left.

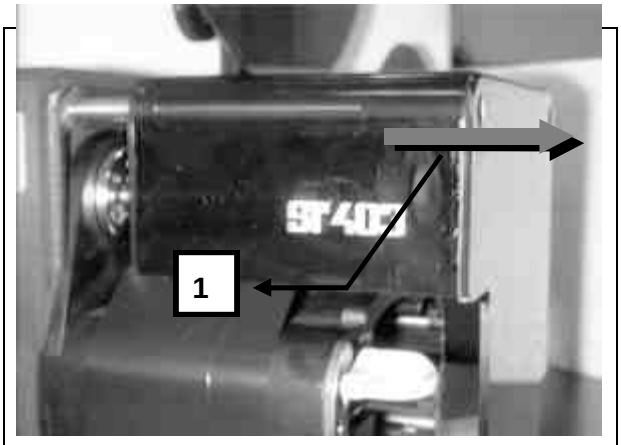
8. PRELIMINARY OPERATIONS

WARNING: Before carrying out the operations described below, turn off the machine using the power switch as described in paragraph 6.2, and remove the "SCHUKO" plug of the power cable from the socket as shown in point 2, paragraph 6.



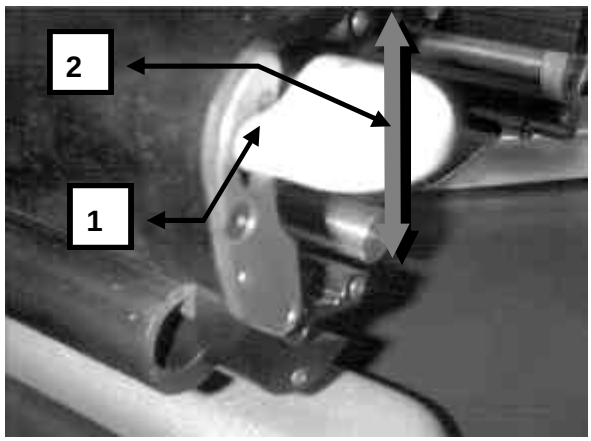
KEY:
1. **PLEXIGLASS CASE**
2. **YELLOW FASTENING KNOBS**
3. **PRINTER MODEL NO.**

Unscrew the two yellow knobs fitted to the plexiglass cover, as shown in the figure on the left.



KEY:
1. **THE ARROW SHOWS THE DIRECTION IN WHICH THE COVER SHOULD BE REMOVED**

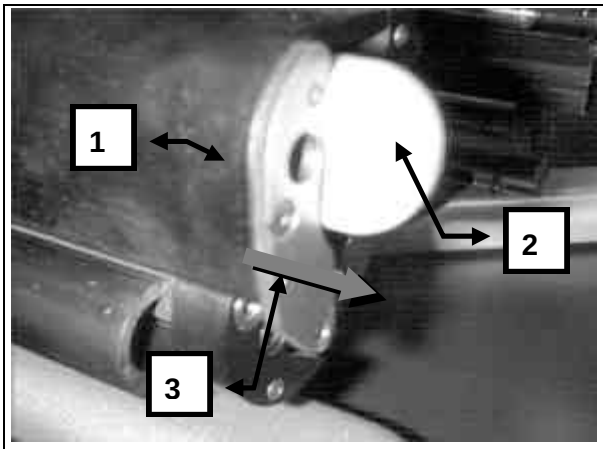
Remove the plexiglass cover, by gently pulling it away from the machine, as shown in the figure on the left.



KEY:
1. **PRINTHEAD LIFTING HANDLE**
2. **ROTATION DIRECTION**

Lift the printhead by turning the yellow handle 90° downwards, as shown in the figure on the left.

WARNING: Do not put your fingers between the printhead and the rubber coated roller.



KEY:

1. **REPLACEABLE CARTRIDGE**
2. **HANDLE POSITION DURING REMOVAL**
3. **ARROW SHOWING THE DIRECTION IN WHICH THE CARTRIDGE SHOULD BE REMOVED.**

Remove the replaceable ribbon cartridge from the machine by pulling it, as shown in the figure on the left.

Once it is removed, the cartridge should be put on a stable work surface.

The replaceable cartridge is an extremely fragile component, so it should be handled with the utmost care to prevent accidental falls which could affect the parallelism of its components.

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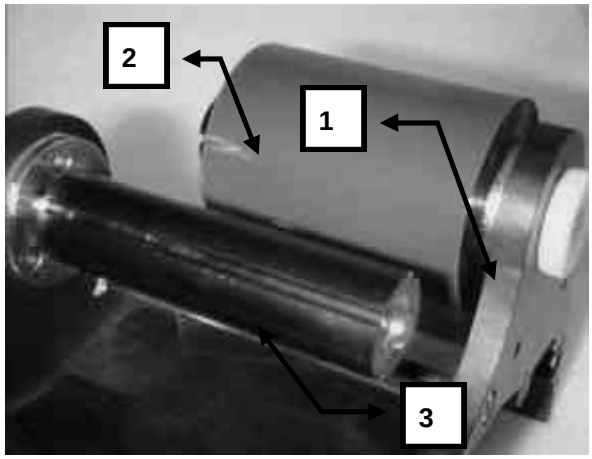
9. PROCEDURE FOR LOADING THE INK RIBBON

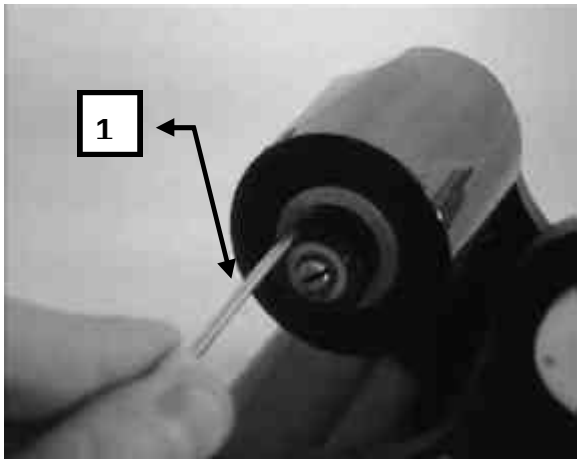


KEY:

1. **UNWINDER SHAFT SUPPORT WITHOUT LABELS**
2. **INK RIBBON ROLL (FOIL)**
3. **REWINDER SHAFT**

Take a new ink ribbon roll **(FOIL)** and place it on the cartridge holder shaft. The replaceable cartridge has two symmetrical aluminium stands which the ribbon holder shafts are fitted to; **"INTERNAL SIDE"** is written on one of these bases. The ribbon roll is fitted to the unwinder shaft and hooked to the other stand (without the label), as shown in the figure on the left

The ink ribbons must be unwinded in an anti-clockwise direction

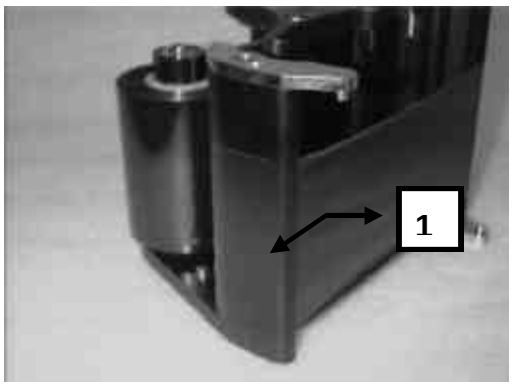


KEY:

1. **RIBBON ROLL FIXING FORK**

Insert the fork to fix the ink ribbon roll, in one of the four holes on the unwinder shaft; choose a hole which adequately fixes the ribbon roll, as shown in the figure on the left.

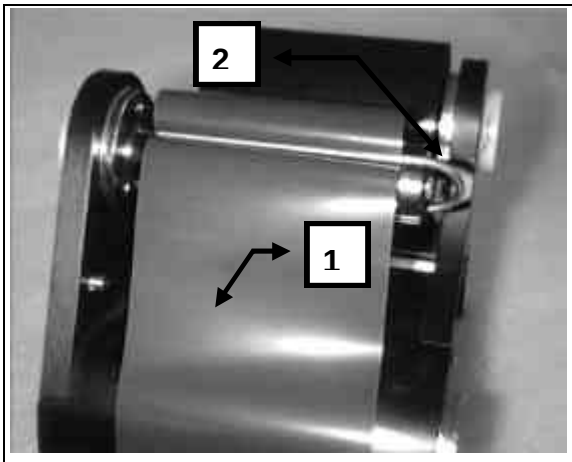
If the ribbon is not adequately fixed, its sidewards movement could affect the printing quality.



KEY:

1. INK RIBBON PATH

Take hold of the first part of the ribbon, which is usually transparent, and wind it around the replaceable cartridge, as shown in the figure on the left.



KEY:

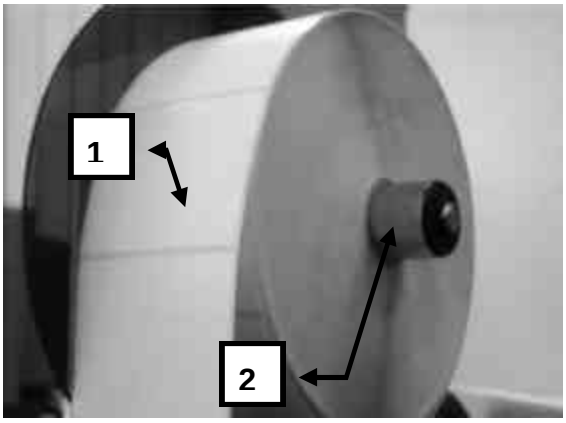
1. FIRST PART OF INK RIBBON
2. REWINDER SHAFT

Place the tape on the rewinder shaft and insert the ribbon blocking fork in its place, wind on all the transparent part of the ribbon, by turning the rewinder shaft in an anti-clockwise direction, as shown in the figure on the left.

In order to easily remove the used ink ribbon from the cartridge it is advisable to put the empty cardboard ribbon cores onto the rewinder shaft, these are held in place by the blocking fork; the ink ribbon should be hooked to the cardboard core using the initial, self-adhesive part or self-adhesive tape.

10. PROCEDURE FOR LOADING THE LABEL ROLL

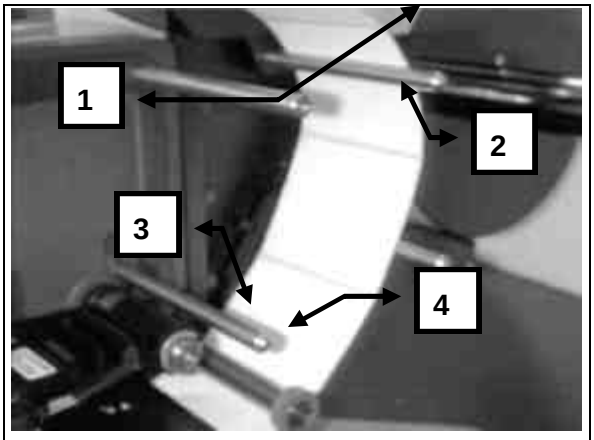
Remove the plexiglass cover from the machine, raise the head and remove the replaceable ink ribbon cartridge, according to the instructions given in paragraph 8.



KEY:

1. **LABEL ROLL ON UNWINDER UNIT**
2. **UNWINDER SHAFT**

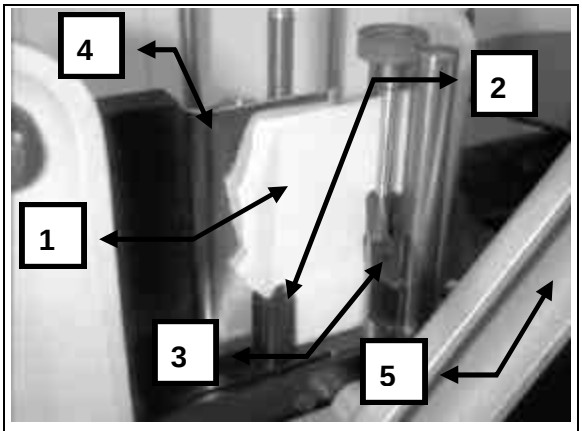
Fit the label roll onto the unwinder unit and push it towards the plexiglass disk, as shown in the figure on the left.



KEY:

1. **SPRING SHAFT**
2. **LABEL STRIP**
3. **PAPER FEED SHAFTS**
4. **RED PAPER FEED**

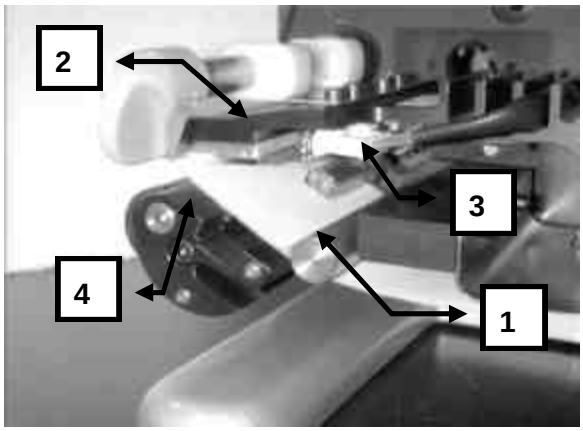
Insert the label strip behind the spring shaft and then guide it between the two paper feed shafts, adjusting the red paper feed guide according to the label width, as shown in the figure on the left.



KEY:

1. **LABEL STRIP**
2. **LABEL DETECTION PHOTOELECTRIC CELL**
3. **MAGNET BRAKE**
4. **STEEL SHEET**
5. **PRINTER SUPPORT**

After inserting the label strip between the two paper feed shafts, the strip has to be guided under the magnet brake and between the steel sheet and label detection photoelectric cell, as shown in the figure on the left. Then push the magnet brake towards the steel sheet.



KEY:

1. **PAPER FEED SHAFT**
2. **PRINTHEAD**
3. **LABEL FEED DETECTION PHOTOELECTRIC CELL**
4. **RUBBER-COATED PRINTING ROLLER SUPPORT**

Insert the label strip under the paper feed shaft and guide it along the sloping surface of the rubber-coated printing roller support. Make sure the strip passes through the label reading photoelectric cell, as shown in the figure on the left.
Guide the label above the rubber-coated printing roller and out of the machine.

After these preliminary steps for loading the label band in order to operate using the :

- **STRIP MODE**

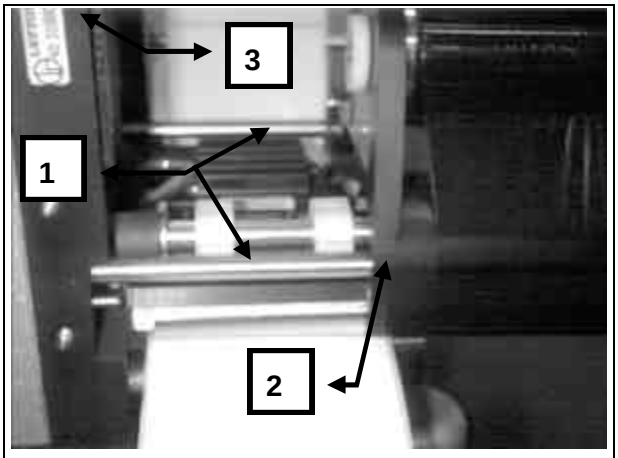
We shall look at the procedure for inserting paper in order to operate in the following modes:

- **REWINDING MODE**
- **DISPENSING MODE**

These two procedures are referred to in appendix “B”.

11. FINAL OPERATIONS

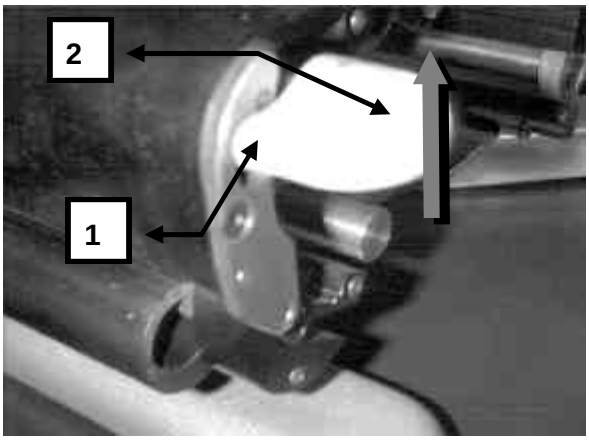
After inserting the labels according to one of the procedures described in the previous paragraph or in appendix B, and/or after placing a new ink ribbon in the replaceable cartridge, the operator must put the cartridge back and replace the plexiglass cover according to the following procedure:



KEY:

1. **CARTRIDGE HOLDER SHAFT**
1. **REPLACEABLE CARTRIDGE**
1. **PRINTER SUPPORT**

Position the replaceable cartridge in such a way that the two holes drilled in the aluminium stands are in line with the two steel holder shafts. Push the cartridge all the way to the printer support base.



KEY:

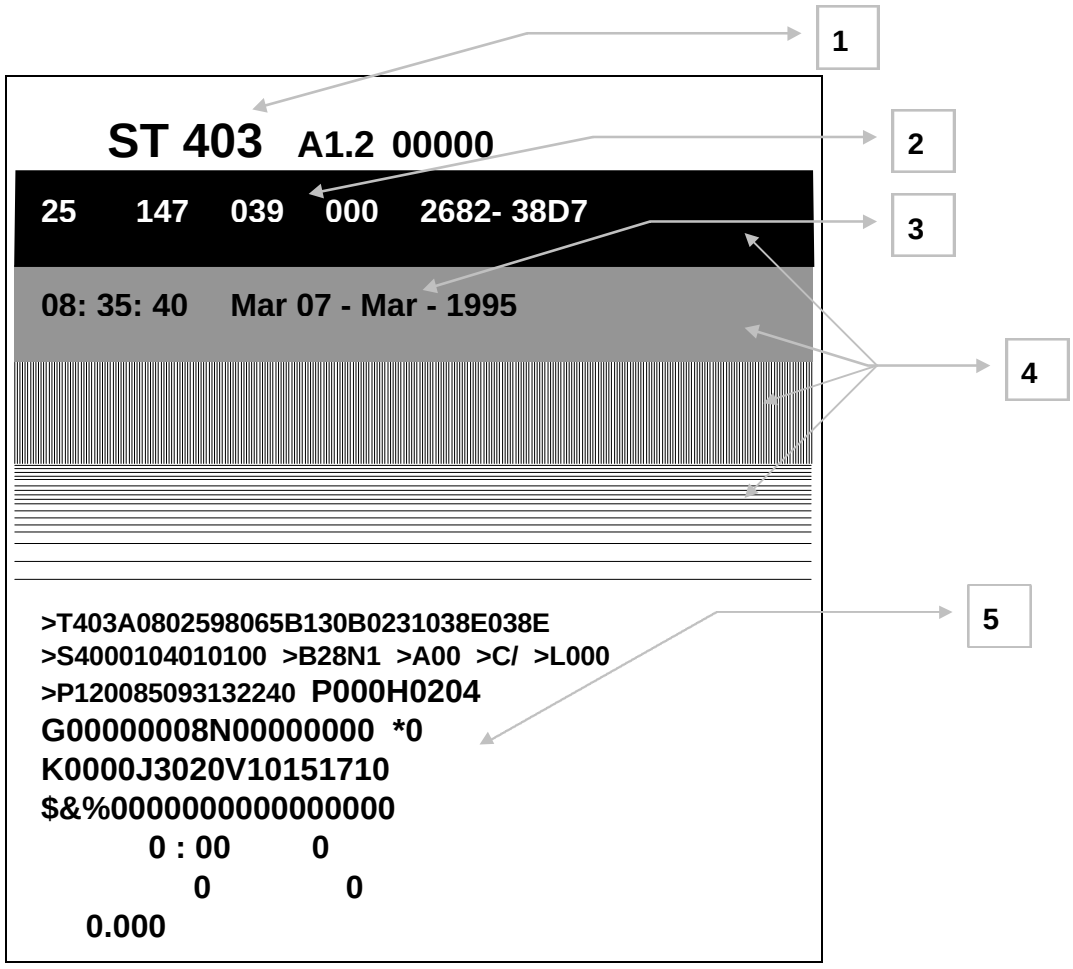
1. **PRINTHEAD LIFTING HANDLE**
2. **SENSE OF DIRECTION OF HANDLE**

Move the printhead to the printing position, by turning the yellow handle 90° upwards, as shown in the figure on the left.
After this, replace the plexiglass cover and fix it with the two yellow knobs.

12. USING THE PRINTER

After turning on the machine, the **"POWER"** switch lights up, and after a brief start-up stage, the **"LINE"** light comes on. If the printer is in normal working conditions, in other words labels and ink ribbon, if required, have been inserted, a test label is printed out (unless this option is disactivated during configuration), the **"PRINT"** light comes on during printing.

The test label (printed when the machine is turned on) is divided into the following parts:



KEY:

1. **PRINTER MODEL - FIRMWARE VERSION - SERIAL NUMBER**
2. **HEAD TEMPERATURE . PHOTOSENSOR SENSITIVITY (LABEL FEED - LABELS INSERTED - END OFF RIBBON)**
3. **DATE AND TIME**
4. **TEST TO CHECK HEAD OPERATION AND ALIGNMENT: THIS CONSISTS OF ONE BLACK AND ONE GREY AREA WITH VERTICAL AND HORIZONTAL BARS.**
5. **CURRENT PARAMETERS VALUES IN THE NON-VOLATILE MEMORY.**

where the current values of the parameters contained in the nonvolatile storage are the following:

>T... IDENTIFICATION OF THE MACHINE AND MEMORY CONFIGURATION PARAMETERS
>S... PARAMETERS FOR THE LABEL PAPER FEED
>B... PARAMETERS FOR THE SERIAL INTERFACE
>A... NETWORK ADDRESS
***...** PRINT ORIENTATION
>P... PHOTOSENSORS SENSITIVITY
P... SENSITIVITY OF PHOTOSENSOR CHOSEN FOR LABEL READING
H... PARAMETER WHICH CONTROLS LABEL POSITION BELOW THE HEAD
G... PRINTING AREA ORIGIN COORDINATES
N... CUTTER AND APPLICATOR PARAMETERS AND BACKFEED VALUE
K... OPERATIVE MODE
V... PAPER FEED SPEED AND VIEW PRINT
J... PRINT SPEED AND HEAD ENERGY
$&%... ACTIVATED FUNCTIONS

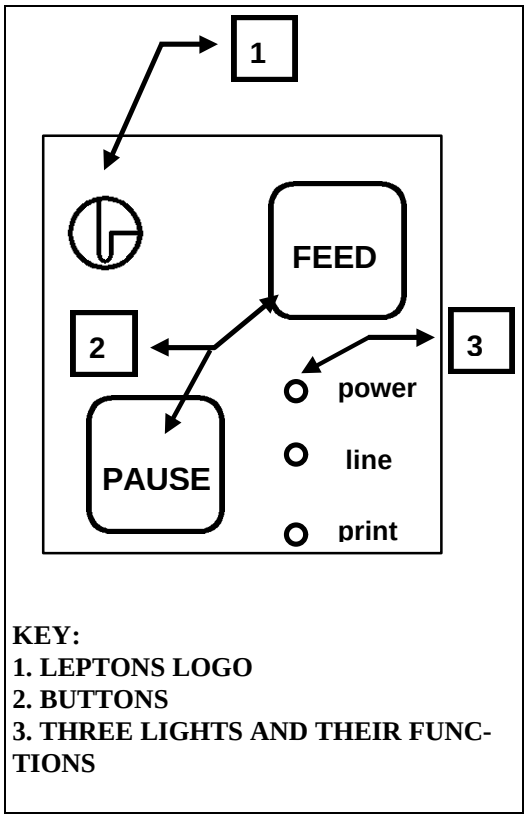
The last three label lines show the value of some of the machine's internal counters:

0:00 TOTAL AMOUNT OF TIME THE MACHINE IS SWITCHED ON
0 NUMBER OF TIMES THE MACHINE HAS BEEN SWITCHED ON
0 TOTAL NUMBER OF LABELS PRINTED
0 NUMBER OF TIMES THE RIBBON ECONOMIZER HAS BEEN ACTIVATED
0.000 TOTAL AMOUNT OF PRINTED PAPER (IN METRES)

The format used to represent the parameter values is the same as the one used for corresponding commands which can be sent from the external control device.
A complete description of the comands on the test label is included in the **"PROGRAMMING MANUAL"**.

13. PRINTER FRONT PANEL AND OPERATIVE MODES

The ST 400 printers are equipped with a front command pannel, consisting of two buttons and a series of lights, the panel is fully illustrated in the figure shown below.



KEY:
1. LEPTONS LOGO
2. BUTTONS
3. THREE LIGHTS AND THEIR FUNCTIONS

The various components perform the following functions:

13.1. - BUTTONS

There are two buttons on the printer control panel, protected by a film:

PAUSE Press this button to switch from **ON-LINE** or **PRINTING** to **OFF-LINE** and vice-versa, and stop the printing session .

FEED If the machine is **ON-LINE** or **PRINTING**, this button is not activated. If the machine is **OFF-LINE** press the button once to print a copy of the last label printed or to print a blank label (depending on the machine's configuration).

Press these two buttons at the same time to abort the current printing session.

Press the two buttons at the same time as you switch on the machine to activate the reset procedure for the configuration parameters stored in the machine's non-volatile memory; the parameter default values are then loaded. This procedure may be useful in the event of some erroneously programmed critical parameters, which could block the printer and which cannot be corrected via the serial line.

13.2. - LIGHTS

There are three different coloured lights on the printer's front panel; they have the following functions:

POWER This light is **RED,** when it is lit the machine is switched on.

LINE This light is **GREEN,** it indicates the status of the Command Interpreter. It is usually **ON** and this shows that the machine is **ON-LINE,** i.e. received data can be processed. The light **FLASHES** at irregular intervals while the **Command Interpreter** is processing data in the reception buffer. It **FLASHES** at regular intervals when additional data are needed to complete a command or when the printer is waiting for variable data to complete the next label to be printed. The light is **OFF** when the **Command Interpreter** is not processing data received, as the machine is **OFF-LINE** or **PRINTING.**

PRINT This light is **YELLOW,** it informs the operator about the current printing session. It is **OFF** when the machine is not printing or when printing is pending (the print command may have been entered but not immediately processed). The light is **ON** when printing is underway, even if the machine is not actually printing out labels, because it is waiting for data for the variable fields. The light **FLASHES** at regular intervals when printing has been interrupted for any reason (pause command, printing error, erroneous sychronization with the external device, etc). The interval at which the light flashes indicates the reason for the interruption, if the error can be automatically recovered or if the operator has to manually correct it (see the relevant paragraph on return messages in **the "PROGRAMMING MANUAL").**

13.3. - OPERATIVE STATUSES

The ST 400 printers have three main operating statuses:

ON-LINE This is the normal operating status, the **GREEN LINE** light is on and the machine is ready to process incoming data from the serial line.

PRINTING This is the normal printing status after a print command has been entered, the **YELLOW PRINT** light is on, the machine cannot process incoming data but saves them in the reception buffer, unless the printer has been configured with the double bit-

map. In this case data are processed for the next label while the current one is being printed.

OFF-LINE When the machine is off-line, the **LINE** light is off, the **PRINT** light is off (or flashing to show that printing has been interrupted) and incoming data cannot be processed but are stored in the reception buffer.

14. PRINTER CONFIGURATION

The ST 400 printers are usually set-up at the factory, according to standard parameters which enable optimal use of the machine; however it may be necessary to set-up the machine again to adapt it to new operating conditions required by the system in use. The operator must consult the machines's "**PROGRAMMING MANUAL**" for the commands which are required for costumized printer configuration.

15. MAINTENANCE

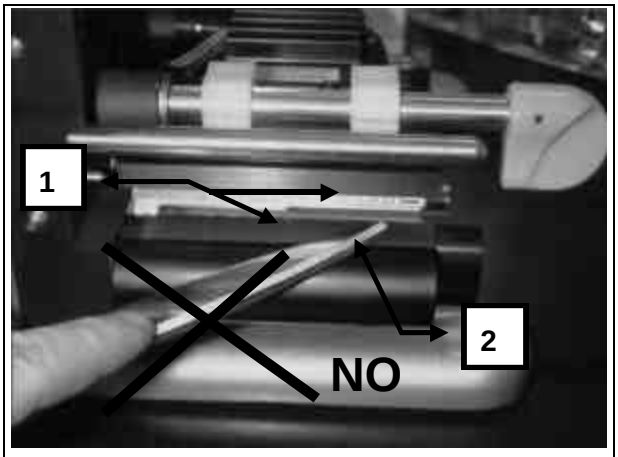
As the printer only has a few moving parts, special maintenance is not required; the following machine parts, which can get dirty, should be cleaned at regular intervals:

- **PRINTHEAD**
- **RUBBER-COATED PAPER FEED ROLLER**
- **METAL PAPER FEED SHAFTS**
- **LABEL DETECTION PHOTOSENSOR AND INK RIBBON**

It is advisable to carry out maintenance weekly if the machine is used frequently, monthly or fortnightly if it is used infrequently.

A brush can easily remove dust residues caused by the labels moving; take particular care to clean the label and ink ribbon detection photosensor holes.

The printhead, rubber-coated roller and paper feed shafts should be cleaned using a soft cloth dampened with a mild solvent such as denatured acohol or isopropyl alcohol.



KEY:
1. **RUBBER-COATED ROLLER AND PRINTHEAD**
2. **METAL OBJECT**

WARNING: Do not use metal or hard objects for cleaning the printhead and rubber-coated roller (see figure).

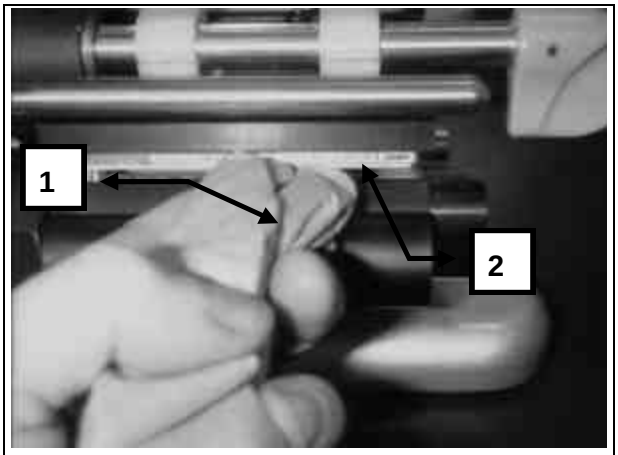
Before carrying out maintenance, the operator must follow the instructions given below:

WARNING: Turn off the printer switch located on the machine's rear panel and remove the plug from the mains.

Remove the plexiglass cover, raise the printhead and remove the replaceable cartridge (without labels) from its base, according to the procedure in paragraph 8.

The machine is now ready for maintenance to be carried out as follows:

15.1. - CLEANING THE PRINTHEAD

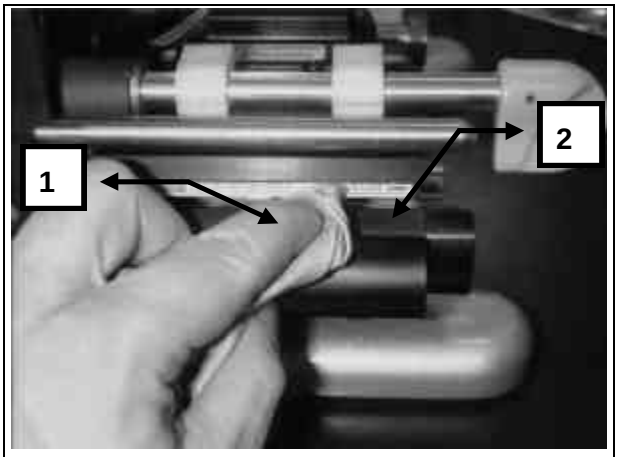


KEY:
1. **SOFT CLOTH DAMPENED WITH ALCOHOL**
2. **PRINTHEAD**

Use a **SOFT CLOTH** dampened with isopropyl alcohol to wipe away all printing residues from the printhead, as shown in the figure on the left.

The printing quality of the machine depends on a thorough cleaning of the printhead.

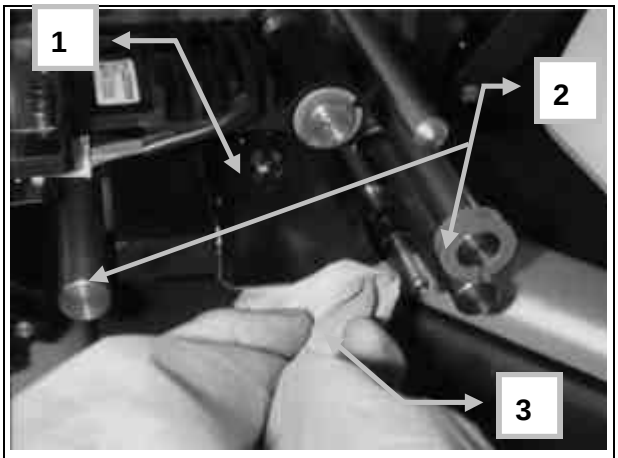
15.2. CLEANING THE RUBBER-COATED ROLLERS



KEY:
1. **SOFT CLOTH DAMPENED WITH ALCOHOL**
2. **RUBBER-COATED ROLLER**

Use a **SOFT CLOTH** dampened with isopropyl alcohol to wipe away all traces of dirt (silicone residues and any ink-ribbon residues) accumulated during label printing from the rubber coated shafts, as shown in the figure on the left. The machine's printing quality is greatly affected by the condition of the rubber-coated rollers; these are mechanical components which feed the paper so if they are dirty the paper may slip and consequently affect printing quality.

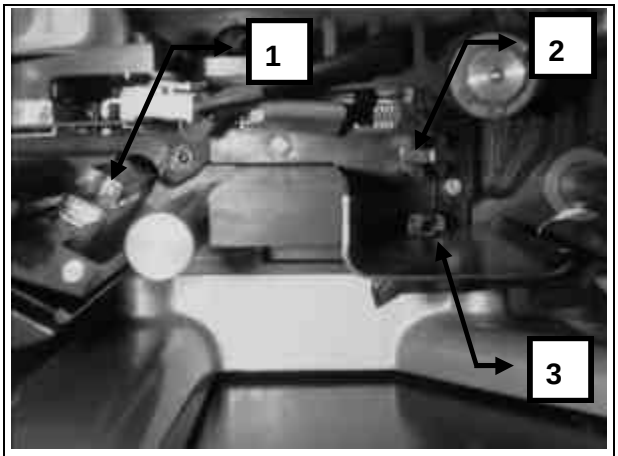
15.3. CLEANING THE METAL PAPER FEED SHAFTS



KEY:
1. **SHEET STEEL**
2. **METAL PAPER FEED SHAFTS**
3. **SOFT CLOTH DAMPENED WITH ALCOHOL**

Use a **SOFT CLOTH** dampened with isopropyl alcohol to wipe away all traces of dirt (glue residues) accumulated during label printing from the metal paper feed shafts, as shown in the figure on the left.

15.4. CLEANING THE LABEL DETECTION PHOTOSENSORS AND INK RIBBON



KEY:

1. **LABEL FEED PHOTOSENSOR**
2. **INK RIBBON PHOTOSENSOR**
3. **LABEL PHOTOSENSOR**

The three photosensors should be cleaned using a soft brush or compressed air to remove dust residues caused by label unwinding, the position of the three sensors is shown in the figure on the left.

After carrying out maintenance, re-insert the labels, replaceable ink ribbon cartridge and fit the plexiglass cover according to instructions given in relevant paragraphs.

16. TROUBLESHOOTING

Some small problems can be easily solved by the operator. If a part of the **ST 400** printer does not work, consult the points listed in the tables below before calling for **Technical Assistance**.

PROBLEM	POSSIBLE CAUSE	ACTION
THE MACHINE DOES NOT COME ON. (POWER SWITCH IS OFF)	THE MACHINE HAS NOT BEEN PROPERLY CONNECTED TO THE POWER SUPPLY.	CHECK THE POWER CABLE AND POWER SUPPLY.
	FAULTY FUSE.	UNPLUG THE POWER CABLE, CHECK THAT THE FUSES ON THE REAR PANEL HAVE NOT BLOWN. REPLACE ANY BLOWN FUSES WITH THE SAME TYPE FUSE.
	INTERNAL FAULT.	CALL FOR TECHNICAL ASSISTANCE.
THE MACHINE DOES NOT OPERATE. (POWER SWITCH IS ON)	INTERNAL FAULT.	CALL FOR TECHNICAL ASSISTANCE
THE MACHINE IS WORKING BUT DOES NOT PRINT OUT THE TEST LABEL.	LABELS AND/OR INK RIBBON HAVE NOT BEEN INSERTED	INSERT THE LABELS AND/OR INK RIBBON CORRECTLY.
	THE PRINTHEAD IS RAISED.	MOVE THE PRINTHEAD TO THE PRINTING POSITION.
	THE TEST LABEL IS DISACTIVATED	SET-UP THE MACHINE AGAIN.

PROBLEM	POSSIBLE CAUSE	ACTION
THE PRINTER DOES NOT RESPOND TO COMMANDS ENTERED VIA THE EXTERNAL CONTROL DEVICE.	UNSUITABLE OR FAULTY CABLE, THE CABLE IS PLUGGED IN INCORRECTLY.	CHECK THE CABLE AND/OR REPLACE IT.
	COMMUNICATION PARAMETERS ARE INCORRECT.	CHECK THAT THE PRINTER BAUD RATE CORRESPONDS TO THE EXTERNAL CONTROL DEVICE RATE, AND MAKE SURE THE COMMUNICATION PARAMETERS ARE COMPATIBLE WITH PRINTER ONES.
	INTERNAL FAULT.	CALL FOR TECHNICAL ASSISTANCE.
THE LABELS ARE UNWOUND WITHOUT BEING PRINTED.	THE PRINTHEAD IS RAISED (PRINTER WITH REWINDER).	LOWER THE HEAD TO THE PRINTING POSITION.
	HEAD CONNECTION (FLAT CABLE AND POWER CABLE).	MAKE SURE THE FLAT CABLE IS CORRECTLY PLUGGED INTO THE HEAD CONNECTOR AND THAT THE HEAD POWER CABLE IS CORRECTLY PLUGGED IN.
	FAULTY HEAD.	REPLACE THE HEAD OR CALL FOR TECHNICAL ASSISTANCE.
	INTERNAL FAULT	CALL FOR TECHNICAL ASSISTANCE.
IRREGULAR PAPER FEED. .	DIRTY, DAMAGED OR WORN RUBBER-COATED ROLLER.	CLEAN THE ROLLER WITH A SUITABLE SOLVENT OR CALL FOR TECHNICAL ASSISTANCE TO REPLACE IT.
	INCORRECT PAPER PATH.	CHECK THAT THE LABEL ROLL HAS BEEN CORRECTLY INSERTED.
	THE LABELS GET STUCK.	USE A SUITABLE SOLVENT TO REMOVE ANY GLUE RESIDUES

PROBLEM	POSSIBLE CAUSE	ACTION
POOR PRINTING QUALITY (ALL PARTS OF THE LABEL)	UNSUITABLE PAPER AND/OR INK RIBBON.	REPLACE WITH APPROPRIATE PAPER AND/OR INK RIBBON.
	ERRONEOUS CONFIGURATION (HEAD ENERGY SPEED).	SET-UP THE PRINTER AGAIN USING CORRECT PARAMETER VALUES.
	LOW HEAD PRESSURE APPLIED TO THE LABEL.	CHECK PRINTING BY EXERTING SLIGHT PRESSURE ON THE HEAD, CALL FOR TECHNICAL ASSISTANCE IF NECESSARY.
	THE HEAD IS WORN OR DAMAGED.	REPLACE IT OR CALL FOR TECHNICAL ASSISTANCE.
POOR PRINTING QUALITY (PARALLEL LINES IN THE DIRECTION OF THE PAPER FEED)	THE HEAD IS DIRTY.	CLEAN THE HEAD WITH A SUITABLE SOLVENT.
	THE HEAD IS WORN OR DAMAGED.	REPLACE THE HEAD OR CALL FOR TECHNICAL ASSISTANCE.
	THE RUBBER-COATED ROLLER IS DIRTY, WORN OR DAMAGED.	CHECK THE ROLLER AND CALL FOR TECHNICAL ASSISTANCE TO REPLACE IT, IF NECESSARY.
POOR PRINTING QUALITY (faint areas)	DIRT BETWEEN THE PAPER AND THE INK RIBBON.	MAKE SURE MATERIALS USED ARE CLEAN.
	UNSUITABLE PAPER.	REPLACE WITH BETTER SURFACE FINISH PAPER.
	THE RUBBER-COATED ROLLER IS DAMAGED.	CHECK THE ROLLER AND CALL FOR TECHNICAL ASSISTANCE TO REPLACE IT, IF NECESSARY.
WHITE LINES IN THE DIRECTION OF THE PAPER FEED.	THE HEAD IS DIRTY OR DAMAGED.	CLEAN WITH A SUITABLE SOLVENT AND REPLACE THE HEAD IF NECESSARY, OR CALL FOR TECHNICAL ASSISTANCE.
	INTERNAL FAULT.	CALL FOR TECHNICAL ASSISTANCE.

17. APPENDIX "A"

17.1. EXTERNAL EQUIPMENT INTERFACES

This range of printers has been designed to easily interface with most equipment adopted in industry.

All the connectors of the various interfaces are located on the printer's rear panel, these are:

- **SERIAL INTERFACE**
- **PARALLEL INTERFACE**
- **APPLICATOR INTERFACE**
- **OPTOINSULATED INPUT INTERFACE**
- **RELAY OUTPUT INTERFACE**
- **CUTTER/REWINDER INTERFACE.**

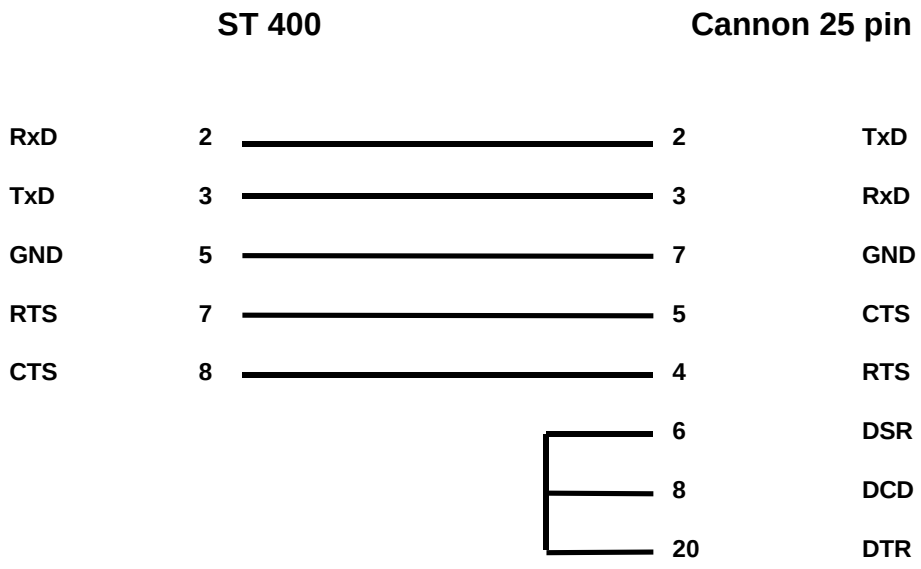
17.2. SERIAL INTERFACE

The terminal pins of the Cannon 9 pin female connector are described in the table below. This connector has the function of bidirectional asynchronous communication with external control devices (such as Personal Computers and other equipment with a compatible interface).

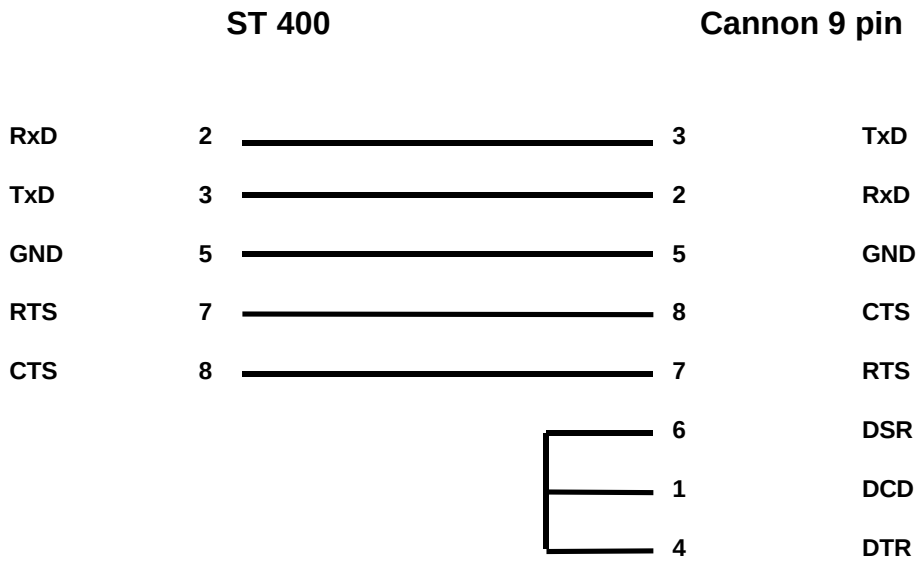
The connector has the following pins and signals:

PIN	SIGNAL	DESCRIPTION
1	-	Not connected
2	RxD	Data Received - input signal
3	TxD	Data Transmitted - output signal
4	DTR	Data Terminal Ready - output signal
5	GND	Logical ground
6	-	Not connected or auxiliary voltage (+5V); this can be selected in the printer with a jumper.
7	RTS	Request to Send - output signal
8	CTS	Clear to Send - input signal
9	-	Not connected

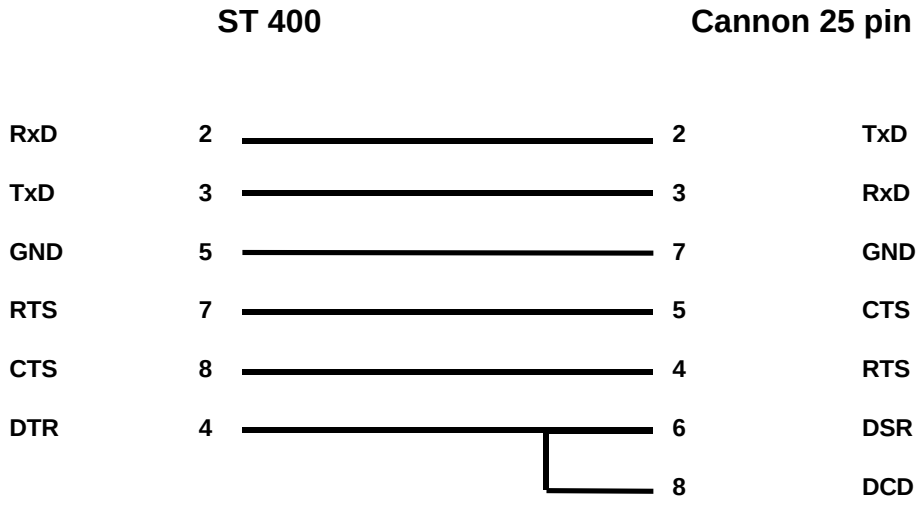
The terminal pins of a serial cable for a Personal Computer which has a serial port with a Cannon 25 pin connector are shown below:



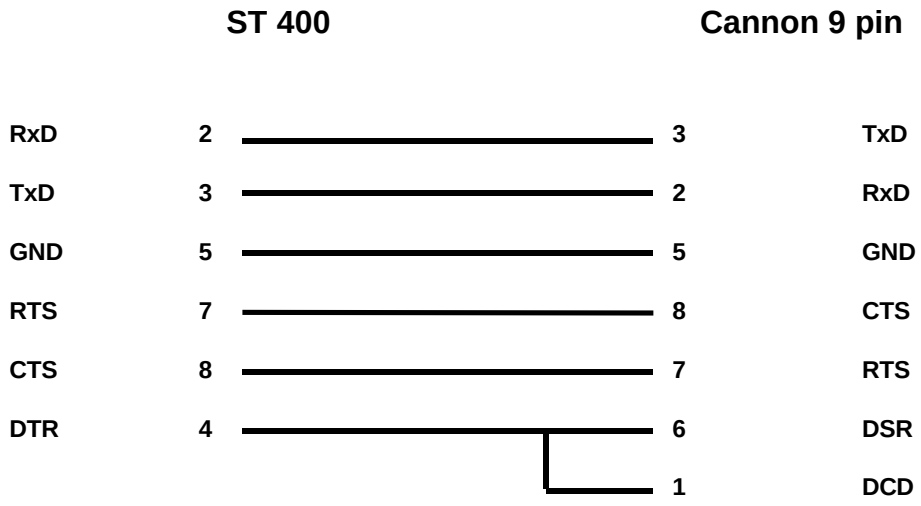
The terminal pins of a serial cable suitable for a Personal Computer which has a serial port with a 9 pin Cannon connector are shown below:



The **"DTR"** signal on pin no. 4 of the printer's serial connector is not included in the tables illustrated above, as this signal is not essential for using the machine and **DATAPROCESS INDUSTRIA** software. If this signal is required, the data cable terminal pins need to be modified according to the following diagrams:



The terminal pins of a serial cable suitable for a Personal Computer which has a serial port with a Cannon 25 pin connector are shown below:



17.3. PARALLEL INTERFACE

The terminal pins of the Cannon 25 pin female connector are shown in the table below. This connector has the function of supplying a data input port which is compatible with the Centronics standard which makes it possible to interface the printer with external control devices (such as Personal Computers and other equipment with a compatible interface).

The connector has the following pins and signals:

PIN	SIGNAL
1	/STROBE
2	DATA 1
3	DATA 2
4	DATA 3
5	DATA 4
6	DATA 5
7	DATA 6
8	DATA 7
9	DATA 8
10	/ACKNOWLEDGE
11	BUSY
12	PAPER EMPTY
13	SELECT
14	Not connected
15	+ 5 VDC Auxiliary voltage
16	Not connected
17	Not connected
18	GROUND
19	GROUND
20	GROUND
21	GROUND
22	GROUND
23	GROUND
24	GROUND
25	GROUND

The parallel interface has been designed to supply a bidirectional transfer of data for special applications.

17.4. APPLICATOR INTERFACE

The terminal pins of the Cannon 9 pin female connector are shown below. This connector makes it possible to control an automatic label attacher which can be fitted to the machine.

The connector has the following pins and signals:

PIN	SIGNAL
1	GROUND
2	INPUT 1
3	OUTPUT 1
4	INPUT 2
5	OUTPUT 2
6	INPUT 3
7	OUTPUT 3
8	INPUT 4
9	+ 12 VDC

The outputs are open collector transistors with re-circulation diodes which can withstand a voltage of up to **+40 VDC**. These can be used to ground small loads (up to 500 mA), including inductive ones, such as solenoids. These loads can be powered by +**12 VDC** from pin no. 9 of the connector.

The inputs have an input voltage from **2.5** to **3.5 V** and are protected to withstand an overvoltage of up to **+ 40 VDC**.

Software for attacher management is not supplied with the current firmware version of the printer.

17.5. OPTOINSULATED INPUT INTERFACE

The terminal pins of the Cannon 9 pin female connector are shown in the table below. This connector makes it possible to receivinsulated interface signals from external devices such as industrial PLC's, photoelectric cells, microswitches, etc.

The female connector has transmits the input signals of two optoinsulators and also supplies auxiliary voltage and ground

The connector has the following pins and signals.

PIN	SIGNAL
1	GROUND
2	OPTO 1- positive
3	OPTO 1 - negative
4	Not connected
5	Not connected
6	Not connected
7	OPTO 2 - negative
8	OPTO 2 - positive
9	+ 12 VDC auxiliary voltage (500 mA max.)

The two optoinsulated inputs are compatible with a voltage ranging from **10** to **30 VDC**.

These inputs do not have a special function as yet, but their status can be read by the external control device via the status command. Refer to the description of return commands and codes in the printer **"PROGRAMMING MANUAL".**

17.6. OUTPUT RELAY INTERFACE

The terminal pins of the Cannon 9 pin male connector are shown in the table below. This connector has the function of supplying insulated interface signals to external devices such as industrial PLC's, photoelectric cells, microswitches, etc.

The male connector conveys signals from the two relay contacts, termed **READY** (with two sets of contacts) and **SYNC** (with one set of contacts).

The pins and signals are shown below:

PIN	SIGNAL
1	READY - common 1
2	READY - normally open 1
3	READY - normally closed 2
4	READY - common 2
5	READY - normally open 2
6	SYNC - normally closed
7	SYNC - common
8	SYNC - normally open
9	READY - normally closed 1

The **READY** relay is active when the machine is in normal working conditions (**ON - LINE** or **PRINTING)** and inactive when the machine is not operating (**OFF - LINE or simply turned off**). The signal **DTR** on the serial interface connector has the same functions.

The **SYNC** relay is activated when the machine starts printing one label and is disactivated when the label is printed. If the machine is in a form feed printing mode, without a time interval between labels, no status transition is visible on the contacts unless the last label has been printed and the machine is stationary. This relay is normally used when the machine is programmed to wait for a synchronization signal before printing the next label.

17.7. CUTTER/REWINDER INTERFACE

The terminal pins of the 4 pole male connector are shown in the table below. This connector has the function of controlling two pieces of optional equipment the cutter and the label rewinder.

The pins and the signals are the following:

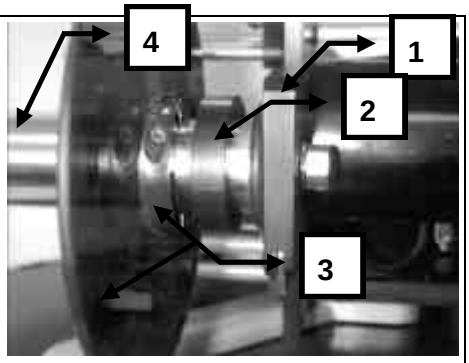
PIN	SIGNAL
1	Not connected
2	Input signal from the cutter microswitch
3	GROUND
4	Output voltage for the cutter or rewinder motor (+12VDC)

Software for cutter management is not supplied with the current firmware version of the printer.

18. APPENDIX "B"

Fit the unwinder/rewinder unit according to the instructions given in paragraph 7.

18.1. - FITTING THE PLEXIGLASS DISK ONTO THE REWINDER



KEY:

1. **REWINDER SHAFT SUPPORT**
2. **8 mm SPACER**
3. **PLEXIGLASS DISK WITH FLANGE**
4. **REWINDER SHAFT**

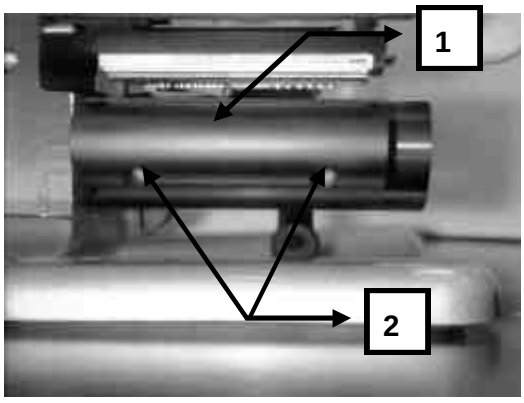
Remove the 8 mm spacer and small plexiglass disk from their packaging.

Fit the spacer and then the plexiglass disk onto the rewinder's label roller shaft, make sure the flange faces the aluminium support.

Push the components towards the support and tighten the screw on the flange, as shown in the figure on the left.

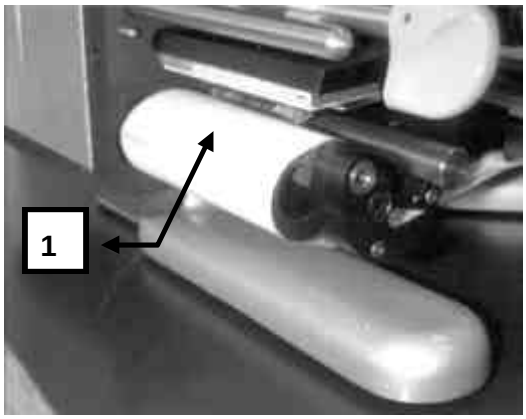
18.2. LOADING THE PAPER FOR THE REWINDER MODE

This operative mode is normally used when a large number of labels have to be printed and these have to be rewound in order to be used at a second stage.



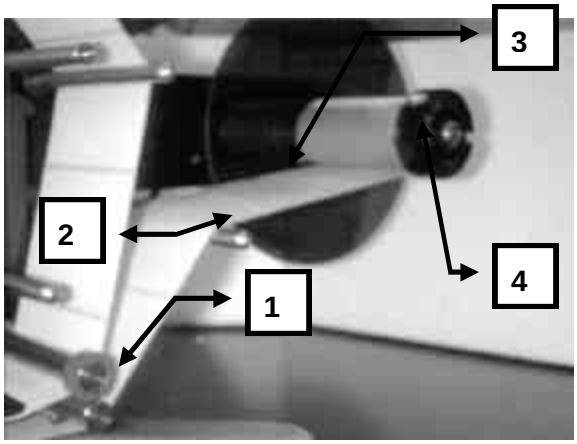
KEY:
1. TRANSMISSION ROLLER
2. SECURING SCREWS

In this case the printer needs to be equipped with the unwinder/rewinder unit and with the transmission roller, which should be attached to the rubber-coated printer roller support using the two screws supplied.



KEY:
1. LABELS ON THE TRANSMISSION ROLLER

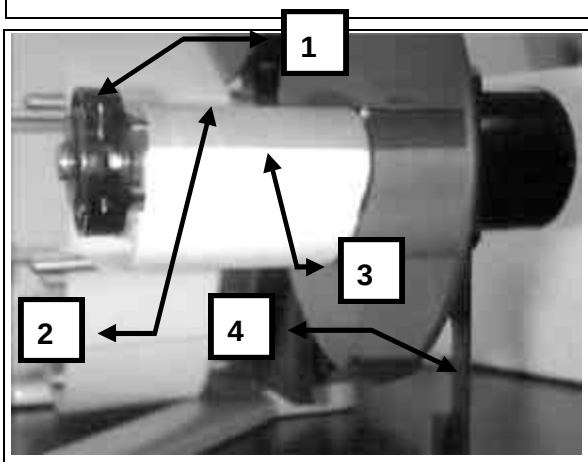
Load the label strip according to the instructions given in paragraph **"10"** and guide it around the transmission roller as shown in the figure on the left.



KEY:

1. **PAPER GUIDE SHAFT**
2. **SPRING SHAFT**
3. **LABEL STRIP**
4. **REWINDER SHAFT**

After this stage, guide the label strip under the paper guide shaft and above the spring shaft before hooking the labels to the rewinder shaft, as shown in the figure on the left.
It is advisable to fit the empty label core to the rewinder shaft in order to facilitate label rewinding.



KEY:

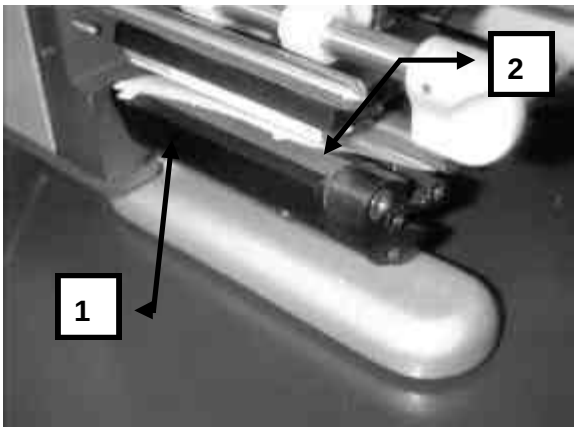
1. **LABEL ROLL CLAMP DEVICE**
2. **LABEL CORE ON REWINDER SHAFT**
3. **LABEL STRIP**
4. **DETACHABLE SUPPORT**

Fit the label roll clamp device onto the rewinder shaft, with the ends facing the core, push the components towards the core and fix them in place by tightening the screw on the flange, lower the detachable support, as shown in the figure on the left.

WARNING: Because of its particular shape the roll core blocking device is potentially hazardous and so it should be handled with the utmost care; once it has been removed from the roll holders it should be placed on a work surface with the ends facing downwards.

18.3. LOADING PAPER FOR THE LABEL DISPENSING MODE

This operative mode is normally used when labels need to be dispensed after printing (i.e. removed from the siliconate backing paper) in order to be manually attached to the product which requires labelling.
In this case the printer needs to be equipped with the unwinder/rewinder unit and with a label stripping blade, as shown in the figure below.



KEY:
1. **LABEL STRIPPING BLADE**
2. **RUBBER-COATED PRINTER ROLLER**

Load the labels according to the instructions given in paragraph “10”.
Remove a 600 mm (approx.) long paper strip and detach all the labels from it. Guide this siliconate paper strip around the label stripping balde, hook the strip to the rewinder unit following the instructions given in paragraph "18.3".